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ABSTRACT

This report provides an analysis and synthesis of findings from research regarding the potential of commercially available instructional materials in supporting teachers to teach for understanding, appreciation, and application in elementary level science, social studies, mathematics, literature, art, and music. The findings also address issues related to what teachers need (knowledge, skills, disposition, context) to make full use of the materials' potential, and what needs to be changed in the materials, and why. The report describes a pattern, or mold, that characterizes commonly used written instructional materials in both format and substance, and it identifies problems and issues that emerge from the mold. Distinctive instructional materials in two subject matter areas (social studies and mathematics) are discussed in relation to their potential for supporting teachers in improving instructional practices. The report also considers the kind of resource that written instructional materials provide for elementary teachers responsible for teaching several subjects across the school day and the potential difficulties and tensions in developing improved materials. Two appendices include a summary of instructional materials and elementary subjects center series, and questions relevant to a curriculum materials analysis. (Contains 68 references.) (LL)

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THE POTENTIAL OF WRITTEN INSTRUCTIONAL
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Cheryl L. Rosaen



Center for the
Learning and Teaching
of Elementary Subjects

Institute for
Research on Teaching
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Center for the Learning and Teaching of Elementary Subjects

The Center for the Learning and Teaching of Elementary Subjects was awarded to Michigan State University in 1987 after a nationwide competition. Funded by the Office of Educational Research and Improvement, U.S. Department of Education, the Elementary Subjects Center is a major project housed in the Institute for Research on Teaching (IRT). The program focuses on conceptual understanding, higher order thinking, and problem solving in elementary school teaching of mathematics, science, social studies, literature, and the arts. Center researchers are identifying exemplary curriculum, instruction, and evaluation practices in the teaching of these school subjects; studying these practices to build new hypotheses about how the effectiveness of elementary schools can be improved; testing these hypotheses through school-based research; and making specific recommendations for the improvement of school policies, instructional materials, assessment procedures, and teaching practices. Research questions include, What content should be taught when teaching these subjects for understanding and use of knowledge? How do teachers concentrate their teaching to use their limited resources best? and In what ways is good teaching subject matter-specific?

The work is designed to unfold in three phases, beginning with literature review and interview studies designed to elicit and synthesize the points of view of various stakeholders (representatives of the underlying academic disciplines, intellectual leaders and organizations concerned with curriculum and instruction in school subjects, classroom teachers, state- and district-level policymakers) concerning ideal curriculum, instruction, and evaluation practices in these five content areas at the elementary level. Phase II involves interview and observation methods designed to describe current practice, and in particular, best practice as observed in the classrooms of teachers believed to be outstanding. Phase II also involves analysis of curricula (both widely used curriculum series and distinctive curricula developed with special emphasis on conceptual understanding and higher order applications), as another approach to gathering information about current practices. In Phase III, models of ideal practice will be developed, based on what has been learned and synthesized from the first two phases, and will be tested through classroom intervention studies.

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Abstract

This report provides an analysis and synthesis of findings from research regarding the potential of commercially available instructional materials in supporting teachers to teach for understanding, appreciation, and application in elementary level science, social studies, mathematics, literature, art and music. The findings also address issues related to what teachers need (knowledge, skills, disposition, context) to make full use of the potential and what needs to be changed in the materials and why. Variations in the potential of the materials in the subject matter areas are discussed. The author describes a pattern, or mold, that characterizes commonly used written instructional materials in both format and substance and identifies problems and issues that emerge from the mold. Distinctive instructional materials in two subject matter areas (social studies and mathematics) are discussed in relation to their potential for supporting teachers in improving instructional practices.

The author considers the kind of resource written instructional materials provide for elementary teachers responsible for teaching several subjects across the school day. The potential difficulties and tensions in developing improved materials are considered and address the following questions: Are improved materials likely or possible? If instructional materials are to be improved, to what extent does the mold need to change? Is it even appropriate to think about improving an instructional materials mold, or is it appropriate to approach improvement from a subject-specific perspective?

THE POTENTIAL OF WRITTEN INSTRUCTION MATERIALS TO IMPROVE INSTRUCTIONAL PRACTICE

Cheryl L. Rosaen¹

Background and Rationale for Studying Written Instructional Materials: Understanding Innovations That May Support Educational Change

There is consensus in the educational community that change is needed in the way we educate youngsters, but not nearly the same amount of agreement about how to go about fostering meaningful change. One promising avenue is to focus on changing teachers' instructional practices and the resources they use to support their practices. Since written instructional materials are one of many potential influences on teachers' practices, they must be studied in relation to their use in particular contexts. The research on written instructional materials discussed in this report attempted to go beyond conducting a subject matter content analysis of elementary textbooks to also include consideration of the materials' likely use, teachers' needs in using the materials (knowledge, skills, disposition, context), and the likely pedagogy and learning community that could develop. Study of materials in several subject matter areas--science, social studies, mathematics, literature, art and music--enabled consideration of the extent to which issues raised are subject-specific or common to the materials across subjects.

According to Fullan (1982) it is important to examine change from the perspective of whether it will bring about actual reform: "Educational innovations are not ends in themselves, but must be subjected to fundamental questions about their relationship to the basic purposes and outcomes of schools" (p. 22). One of the basic purposes of schools is to engage students genuinely in their learning of subject

¹ Cheryl L. Rosaen, assistant professor of teacher education at Michigan State University, is a senior researcher with the Center for the Learning and Teaching of Elementary Subjects. The author wishes to acknowledge the work of her Center colleagues, whose analysis of commonly used and distinctive instructional materials provides the basis for this paper (see Appendix A for the Center series titles and authors), and with whom she developed the framework for analysis of written instructional materials within and across the subject matter areas (see Appendix B).

matter and to create classrooms that are learning settings for all students. Genuine engagement in learning of subject matter includes teaching for understanding, appreciation, and application. It includes the goal of teaching for a "literacy of thoughtfulness" that encompasses "enhanced abilities to think critically and creatively; to reason carefully; to inquire systematically into any important matter; to analyze, synthesize, and evaluate information and arguments; and to communicate effectively to a variety of audiences" (Brown, 1991, p. xiii). The focus of subject matter learning must embrace both understanding the content in a discipline and understanding "ways of knowing" associated with the discipline. Moreover, there must be concern for the extent to which the knowledge that is selected, organized, and represented to children is made accessible to more than the privileged in our society and thus goes beyond being a conserving force to becoming a transformative force that helps people change and improve modern society (Anyon, 1981; Apple, 1979; Brown, 1991; Karabel & Halsey, 1977; McIntosh, 1983).

If these are taken as basic purposes and outcomes of schools, what innovations are likely to bring about improvements in practice that would support the kind of learning outlined? There is much discussion in the educational community regarding the need to change instructional materials available to teachers, based on the assumption that if instructional materials (such as textbooks and their accompanying materials) were of higher quality, teachers could improve their instructional practices. Yet materials are one of several essential and interdependent elements that are involved in bringing about actual change in teaching practice. For example, Fullan (1991) defined change in practice as including at least three essential components:

- (1) the possible use of new or revised *materials* (direct instructional resources such as curriculum materials or technologies, (2) the possible use of new *teaching approaches* (i.e., new teaching strategies or activities), and (3) the possible alteration of *beliefs* (e.g., pedagogical assumptions and theories underlying particular new policies or

program). . . . It is clear that any individual may implement none, one, two, or all three dimensions. A teacher could use new curriculum materials or technologies without altering the teaching approach. Or a teacher could use the materials and alter some teaching behaviors without coming to grips with the conceptions or beliefs underlying the change (p. 37).

Elements that may also need to change include: teachers' experience and ways of knowing in a discipline (Fitzgerald, 1979; Thompson, 1984; Wilson & Wineburg, 1988); teachers' subject matter knowledge (Ball, 1991; Hillocks, 1991; Lawson, 1991; Wilson, 1991); teachers' confidence and abilities as interpreters and users of curricula (Ben-Peretz, 1990; Remillard, 1991); the nature and amount of support for teachers' professional growth and development (Lieberman & Miller, 1991); and larger professional, social, and political influences (Apple, 1986; Fullan, 1982; McIntosh, 1983; Wexler, 1982).

Fullan (1991) also maintained that real change involves changes in teachers' conceptions and role behaviors, not just adopting new programs. Placing the teacher in the role of implementer of instructional packages is a time-honored (although perhaps illusionary) way for administrators and curriculum coordinators to monitor and maintain educational quality (Luke, 1991) and standardize the curriculum (Tyson-Berstein & Woodward, 1991). New conceptions of the teacher as a *learning professional* who not only implements but *interprets, develops, and mediates* the use of instructional materials are required if teachers are to take on active roles in using new instructional practices and bringing about meaningful educational change.

While some researchers argue that the prevalence of textbooks in elementary classrooms makes them a dominant force in defining classroom curricula (Apple, 1985; Barr & Dreeben, 1983; Goodlad, 1983; Tyson-Bernstein & Woodward, 1991; Westbury, 1990), others maintain that evidence regarding the role texts play in determining classroom curriculum and instructional practices is scanty and varies widely in different subject matter areas (Stodolsky, 1988, 1989). Studies do show that

teachers exercise quite a bit of autonomy in deciding what content to teach, how long to spend on it, and which activities to use (Freeman & Porter, 1989; Stodolsky, 1988, 1989), and that there is variation regarding how texts are used in different subject matter areas such as mathematics and social studies (Stodolsky, 1988, 1989). Textbooks and other instructional materials can also influence teachers' classroom talk and the nature of student learning that results (Roth, Anderson & Smith, 1987; Sosniak & Perlman, 1990). More research on how textbooks are used in shaping curriculum and instructional practices is needed to understand their actual influence.

Others cast problems with American textbook content and corresponding pedagogy as centering around textbook development, marketing, and adoption practices that have little to do with teachers and students. For example, Keith (1991) asserted that the major influences on the content of textbooks is not the author, the concerns of teachers, or the characteristics and interests of the students, but rather the textbook industry's organization and practices. Tyson-Bernstein (1987) and Tyson-Bernstein and Woodward (1991) argued along similar lines, calling for a dismantling of the textbook system. Marshall (1991) pointed out that since non-educators are largely involved in textbook adoption practices, they need to be better educated about what to look for in texts and more involved in developing state guidelines. These authors see the needed source of change in texts (which, they maintain, will lead to better instructional practices) to be the textbook adoption process itself. Instead of looking to textbook developers to address problems, among other things, many call for more leadership from local and state committees involved in textbook selection as well as greater teacher involvement to get away from the top-down practices that dominate textbook selections.

Looking across the variety of arguments regarding what will (or will not) bring about improvements in instructional practices, one thing that can be said is that instructional materials are *potential sources* of influence on teachers' practice

(Stodolsky, 1989) but they must be considered in relation to a complex set of factors that also influence teachers' instructional practices and ways they might change those practices. As educators consider changing instructional materials as a source for improving instructional practices, it is important to raise several questions: What kinds of instructional practices do textbooks and resource materials appear to encourage? To what degree do the instructional suggestions encourage/discourage teaching of desirable content and use of desirable strategies that might improve instructional practice? What is the potential of written instructional materials to improve instructional practices? What are the limits of the capacity of written instructional materials to improve teaching and learning? What are difficulties and tensions in developing improved materials? Are improved materials likely or possible?

By examining closely the resources available to teachers, educators will be better informed regarding the resources' strengths and limitations in supporting teachers in improving instructional practices. Moreover, by understanding what instructional resources are like within and across the school subjects, educators will be in a better position to make recommendations for improved materials that could be better resources for teachers (as one of many ways to try to facilitate educational change), and to try to influence authors and publishers that these improvements are worthy aims for them to adopt.

Overview

This report provides an analysis and synthesis of findings from research regarding the potential of commercially available instructional materials in supporting teachers to teach for understanding, appreciation, and application in elementary level science, social studies, mathematics, literature, art and music. The findings also address issues related to what teachers need (knowledge, skills, disposition, context) to make full use of the potential, and what needs to be changed

in the materials and why. Variation in the potential of the materials in the subject matter areas is discussed.² Four broad questions (that draw on a common set of framing questions to be discussed in the next section) organized the analysis across the subject matter critiques:

- a. What are similarities and differences in the recommended *courses of study* in the written materials (e.g., goals; content selection, organization, sequencing, explication)?
- b. What are similarities and differences in recommended *pedagogy* and the kind of *learning community* the recommended pedagogy is likely to create (e.g., activities and assignments; teacher-student relationships and classroom discourse)?
- c. What are similarities and differences in recommended approaches to *evaluation* and in *what counts as knowing* in the learning community (e.g., activities and assignments; assessment and evaluation)?
- d. What are similarities and differences in *format*, and to what extent does the format *provide support for the students' learning* and the *teachers' use* of the materials (content explication; activities and assignments; directions to the teacher)?

In considering these questions, more similarities than differences in the commonly used written materials were uncovered. Similar images of a likely course of study, pedagogy and learning community, evaluation approach, and format emerged. I

² This research is part of the Center's research and development on elementary-level teaching in these subject matter areas, with particular emphasis on teaching these subjects for understanding, appreciation, and application. In addition to the curriculum materials critiques, various phases of the work involved review and synthesis of scholarly literature, interview of experts in each subject matter area, examination of state- and district-level policy statements, case studies of exemplary practice, and improvement-oriented intervention efforts. As part of the study of experts' views on teaching for understanding, appreciation, and application in each subject area similar analyses of the same curriculum materials were conducted. These alternative perspectives on the potential of the materials informed this study.

describe a pattern, or mold, that characterizes the commonly used written instructional materials in both format and substance, and identify problems and issues that emerge from the mold. I then describe what we call distinctive instructional materials in two subject matter areas (social studies and mathematics) that attempt to break out of this mold and discuss their potential for supporting teachers in improving instructional practices. I consider, for example, the kind of resource written instructional materials provide for elementary teachers responsible for teaching several subjects across the school day. I discuss potential difficulties and tensions in developing improved materials, and address the following questions: Are improved materials likely or possible? If instructional materials are to be improved, to what extent does the mold need to change? Is it even appropriate to think about improving an instructional materials mold, or is it more appropriate to approach improvement from a subject-specific perspective?

Studying the Potential of the Written Instructional Materials

In each subject matter area (science, social studies, mathematics, literature, art and music), one or more of the most widely used K-6 curriculum materials were analyzed. Based on previous curriculum reviews done on market-share materials, it was not expected that these textbook series would support teaching these school subjects for understanding, appreciation, and application. For some subject matter areas (social studies, mathematics, literature) materials that were considered "distinctive" were analyzed; these were included in the larger study because of their potential for supporting teachers in teaching for understanding, appreciation, and

application.³ Appendix A summarizes the various written instructional materials included in the larger study, and lists the individual reports that provided the basis for this analysis and synthesis across the critiques.⁴

Building on Other Studies of Instructional Materials

Recent critiques of instructional materials, particularly of commonly used textbooks, focus in some way on the substance or content of the textbook. For example, the following features of textbooks have been studied: (a) the quality of the writing in the text (Davison & Kantor, 1982; Graves & Slater, 1986; Sewell, 1987; Tyson-Bernstein, 1987), (b) the overall textbook design such as the use of photographs and illustrations as instructional tools (Tyson-Bernstein, 1987; Woodward, 1988), (c) the selection and organization of subject matter content (Armbruster & Anderson, 1983; Beck & McKeown, 1988; Calfee & Chambliss, 1988; Campbell & Fey, 1988; Efland, 1990; Elliott, 1988; Elliott & Nagel, 1987; Elliott, Nagel, & Woodward, 1985; Larkins & Gilmore, 1987; Ravitch, 1987); (d) how skills are taught in relation to content (Elliott, Nagel & Woodward, 1985; Woodward, 1987), (e) the presence and integration of information

³ The California Literature Program, claiming to be a distinctive literature curriculum for grades K-6, was critiqued in relation to how it addresses a critical/aesthetic approach to teaching literature (see ESC Series No. 55, Critical Analysis of a Distinctive Literature Curriculum, by Cianciolo and Quirk). Although the program is described in four separate documents, and does not provide written materials for students, it was chosen for analysis because of its primary strength: it is based on the use of separate editions of children's literature trade books for each student in each grade level, which addressed a prominent concern raised with the commonly used K-6 literature based series. However, analysis of the program revealed that its primary focus is not on learning about and appreciating literature. Instead, it is a literature-based language arts program in which literature is used as a model for writing or oral composition skills, or for using the content included in literature selections to teach other subject matter, and fine arts. This was the same concern raised with the commonly used K-6 series in relation to how literature is portrayed as a discipline. Moreover, the program lacks specificity and provides few guidelines to teachers regarding creating a learning community that would promote understanding and appreciation of literature. Therefore, the California Literature Program is not discussed here as an example of "distinctive instructional materials."

⁴ At the time the critiques were developed, there were no distinctive materials available in science, art, and music, so alternative materials in these areas are not discussed in this report. A promising K-6 science curriculum series developed by the Biological Sciences Curriculum Study has since become available. These instructional materials are organized around a focused set of central concepts for each grade level.

about gender and ethnicity (Alton-Lee & Densem, 1991; Christian-Smith, 1989; Curry, 1982; Tyson-Bernstein, 1987), and (f) the use of discipline-based, alternative or controversial perspectives in treatment of subject matter content (Elliott & Woodward, 1990; Fitzgerald, 1979). These studies make apparent many problems with the content of student texts, such as coverage of too many topics, lack of depth of coverage, boring and superficial content coverage, lack of conceptual focus on content, artificial separation of content and skills, lack of clarity in relation to instructional goals, neutralization of content and lack of alternative points of view, and inadequate explanation of important concepts. It is argued that such problems with instructional materials make teaching for understanding, appreciation and application in the subject matter areas very difficult. Without better content treatment in the text, the argument goes, how can teachers do a good job?

Yet understanding what gets taught and learned in classrooms requires examining more than just the content selection, organization, and explication in the text materials students read. Other resource materials and assessment devices also play important roles in determining teaching methods used and ways in which student learning is assessed (Porter, 1989; Roth et al., 1987). While we knew our analysis of instructional materials must include a focus on the subject matter content, we sought ways to take a more holistic approach to our analysis that would include consideration of the likely pedagogy in the classroom as well as the nature of the learning community that might result. We wanted to get a richer picture of the potential of the materials in supporting teachers to teach for understanding, appreciation, and application.

The Framing Questions

A common set of framing questions organized around eight categories was used to guide the analyses (see Appendix B). The eight categories include goals, content selection, content organization and sequencing, content explication in the

text, teacher-student relationships and classroom discourse, activities and assignments, assessment and evaluation, and directions to the teacher. These framing questions were developed to take into consideration the dynamic social, and political nature of curriculum that is influenced in part by written instructional materials; that is, we assumed that curriculum is socially constructed by teachers (through selection, interpretation, and often autonomous implementation) and students (through meanings constructed as they interpret text and learning experiences) as they participate in learning settings (including classrooms, schools, home life, community life; economic and social structures) (Barnes, 1976; Ben-Peretz, 1990; Bernhardt, 1987; Schwab, 1973; Wexler, 1982). Curriculum consists of a range of materials such as curriculum guides, syllabi, teacher handbooks, textbooks, instructional materials, assessment devices, curriculum packages, and trade books (Ben-Peretz, 1990). It also consists of meanings constructed through learning activities such as discussion, reading, writing, and completing assignments (Barnes, 1976; Bernhardt, 1987). Therefore, the questions were developed to examine the range of materials available throughout the series, and the suggested learning activities.

The "content" of the instructional materials was analyzed for its selection, organization, and representation of knowledge and ways of knowing (Schwab, 1973). The context for learning, the nature of the learning community likely to develop through suggested learning activities, was considered to be one aspect of understanding ways of knowing. In addition, the questions were designed to include analysis of three aspects of the potential curriculum: that which is made explicit in the materials and the learning activities (the explicit curriculum), that which is implicit in the materials and learning activities (the hidden curriculum), and that which is left out of the curriculum and materials (the null curriculum) (Anyon, 1981; Ben-Peretz, 1990; Eisner, 1985; Flinders, Noddings & Thornton, 1986). Because

instructional materials are resources upon which teachers can draw, one set of questions focused on the amount and nature of support the materials provide to the teacher for becoming familiar with and implementing the program. Finally, in addition to using the framing questions, the texts were analyzed and critiqued on their authors' own terms (i.e., Is this text what the authors propose, and/or do the authors do what they proposed would be done, covered, or treated?).

In summary, the framing questions guided analysis within and across subject matters of the following areas: stated goals and intended outcomes of the curricula; the content selection, organization, and representation; the coherence of content explication in the student text; the suggestions made to the teacher regarding questions to ask the students and about the kinds of classroom discourse that should occur; the nature of the activities and assignments provided in the text or recommended to the teacher; the purposes and nature of the assessment methods provided or recommended; and the nature and extent of the rationales and other elaborated material in the teachers' manual.

**Analysis and Synthesis of Findings Across Subject Matter Areas:
The Modern Instructional Materials Mold
and Its Alternatives**

If someone mentioned the word "textbook" to a room full of people, educators and students alike would probably conjure up a similar image. Their descriptions would probably include many of the following: a textbook is hard-bound; it is heavy; it contains glossy pages with colorful photographs, graphs and drawings which are scattered liberally across the pages; it has lots of boldface headings that organize its printed columns; there are study or review questions at the end of each chapter; the table of contents organizes the chapters into "units." Many of these attributes might be mentioned as assets--ways in which textbooks have been improved over the years to make them more attractive, usable, and interesting to teachers, curriculum committees and students. Likewise, the notion of "instructional materials" might

bring to mind images of a teacher's guide (which includes reduced-print student text to make room for many notes to the teacher), scope and sequence charts, and sets of supplementary materials such as posters and pamphlets, videotapes, or filmstrips. Again, these are often described as assets or improvements designed to make the teacher's job easier and to help the teacher make his or her instruction more engaging for children. To understand fully the extent to which these or other common features not mentioned are actually improvements that might lead to improved learning, a closer look at what makes up the instructional materials mold is required.

Instructional Materials Frame a Potential Course of Study

In its broadest sense, curriculum is a course of study that children encounter in school, and instructional materials can play a major part in framing and organizing the course of study. By considering the recommended goals for a set of materials (e.g., broad aims for developing certain types of knowledge, skills, and dispositions) and the subject matter selection, organization, sequencing and explication, embedded views of the nature of knowledge and what it means to know can be uncovered. Since the extent to which teachers actually follow the recommendations in the materials varies from one classroom to another, the views implicit in the instructional materials can thus be seen as a potential course of study. Even though the instructional materials studied represent, at least partially, potential courses of study in six different subject matter areas, the representations are remarkably similar.

Goals in Commonly Used Instructional Materials

What are the similarities and differences in the developers' broad aims regarding the kinds of knowledge, skills, and dispositions students should develop? How clearly are these aims outlined and defined? To what extent is conceptual understanding, appreciation, and application emphasized? Given the goals, to what

extent are they reflected in the written materials? The six sets of materials that were examined fit into a mold of either (a) claiming to work toward aims that do not actually drive the potential course of study or (b) describing aims that draw on current rhetoric about teaching for understanding but do not provide a rich image of what such teaching and learning entails.

Comparison across the critiques revealed that only two series of instructional materials (literature and art) had clearly stated goals, and these goals are not consistently or clearly addressed throughout the materials. Goals for the mathematics, science, social studies, and music series had to be inferred from descriptions of program rationales and features or gleaned from recommendations to the teacher in the teacher's guide. Conceptual understanding, application and appreciation are included in the rhetoric found in the science, social studies, and literature materials, but the meaning of the terms and how they are played out in the materials varies widely. For example, in the science series, conceptual development, critical thinking, science skills and learning the language of science are discussed as central features. A taxonomy of science skills is even given alongside Bloom's taxonomy. Yet knowledge and skills are treated separately throughout the units, and a "critical thinking" section is included at the end of each science lesson rather than as an integral aspect of the concept development portion of the lessons. Similarly, despite claims that the social studies series will provide a solid factual foundation and instill knowledge and skills, knowledge and skills are treated separately throughout the series. Fostering responsible citizenship seems to be the overarching aim for the series, although the term is never defined nor is it made clear how the knowledge and skills emphasized will help students be such citizens.

In the case of the literature materials, 14 clear and specific goals are given that head toward the overarching aim of providing a solid foundation of literary experiences that will lead to a lifetime of reading pleasure. The literature series

stands out from the others in that it does define goals explicitly that experts in the field would consider worthwhile and valid. However, the literature itself is used as a tool to teach reading and writing skills, and teaching of literary knowledge is limited to coverage of literary elements and genres without helping students make linkages to how that knowledge can help them examine their own aesthetic responses to literature or appreciate literature as art.

The mathematics series is skill-focused with clear messages about the developers' intentions to provide solid skill development with measurable results. Discussion of conceptual development is framed as providing a foundation for the introduction of a particular skill. Although the art and music series do include concept development in their overall descriptions, they actually emphasize production and performance. Conceptual understanding presumably comes into play as students solve math problems, create art (using knowledge of design elements), or sing songs, but there is not an emphasis on constructing knowledge or on understanding one's own thinking in relation to solving problems, creating art, or performing music.

All the series use rhetoric that shows some attention to dispositional goals. Mathematics is to become "meaningful" and "alive." Science will be "enjoyable," and the social studies series will help students develop the "disposition to act as responsible citizens" and address students' "interests." Students will come to "value" literature and come to love art and music. However, these terms are left undefined and no explanation is given as to how students will come to develop such dispositions, or how developing these dispositions relates to the application of knowledge and skills.

The language used in goal descriptions or in program rationales and descriptions of program features may give the impression that conceptual understanding, application, and appreciation are emphasized as important goals.

Closer examination reveals that either the stated goals include conceptual understanding, application, and appreciation but do not actually drive the potential course of study (e.g., in literature and art materials), or they fall short of describing the kind of learning for understanding most experts in each field think is important (e.g., in mathematics, science, social studies, and music materials). This rhetoric may play an important role in marketing instructional materials, but it does not provide vivid and concrete images of how one would work toward the broad aims.

Content Selection, Organization, Sequencing, and Treatment

What are similarities and differences in how knowledge and skills are selected, organized, sequenced and explicated? If recommendations are followed, what do the materials add up to as a potential course of study in each subject area? Pursuing these questions across the different critiques revealed a remarkable similarity that emphasized either "knowing what" (in science, social studies, and literature) or "knowing how" (in mathematics, art, and music). No series emphasized "ways of knowing" in the disciplines, constructing knowledge and figuring out appropriate justifications for what counts as knowledge, or "knowing why."

Spiral of coverage. Each series has some kind of organizational framework around which knowledge was selected and organized across the grades. In some cases, *major areas of study* in the discipline provide an organizing structure, such as the four blocks in the science materials consisting of Life Science, Physical Science, Earth Science, and The Human Body. In the social studies series, an *expanding communities framework* organizes study of universal human needs and experiences in the early elementary years and a cultural literacy of history and geography for U.S. citizens in the upper elementary grades.

Curriculum strands provide organizing structures for the art, music, mathematics, and literature materials. For instance, the art materials are organized around three strands--creating art, looking at art (organized around an expanding

communities framework for the study of art history in the upper grades), and living with art. Similarly, at each grade level, the music content is divided into four sections: music for living (social, historical and cultural study of music which imitates the expanding communities framework), understanding music (concept and skill development), sharing music (performing), and sing and celebrate (holiday and other songs for singing). The mathematics series is organized around common topics or strands that represent mathematical concepts and operations--basic operations of whole numbers, geometry, decimals, fractions, time, and money--that are treated at varying degrees of complexity across the grades. Other topics, such as estimation and mental math, number properties and theories, ratio and percent, are given less space in the materials and treated less frequently across the grades. The literature series is organized around different kinds of strands. Some strands represent actual genres of literature (e.g., fantasy). Others represent topical connections that may emphasize a literary element (e.g., earth, sea, and space emphasize setting). A third type groups selections topically and emphasizes motifs (e.g., growing and changing).

Whether the organizing framework consists of blocks, expanding communities, or curriculum strands, they seem to function as a vehicle for teachers to repeat coverage of topics, concepts, and skills across the grades, but this repetition is likely to result in more redundancies than deepening of knowledge. One science expert's phrase, a "spiral of coverage," is an apt descriptor for how the organizational scheme seems to function in each series; that is, although concepts, topics, and skills are taught more than once over time, and there are some differences in the complexity and depth at which they are treated, there seems to be little attention paid to what students bring to the encounter each time and how one encounter can become part of the next learning experience. Teachers are not encouraged to explore students' thinking about particular concepts or topics nor to consider how their current thinking might shape the way they interpret learning

experiences. Moreover, the organizing frameworks are not driven by powerful themes, issues, or areas of inquiry that might link subject matter study to its application to life in or out of school.

Knowledge is "out there." Just as students' prior knowledge and experiences are apparently not a prominent part of the picture in determining what to cover in each series, students are not cast as central players in developing or constructing knowledge. Knowledge is "out there" to be received and is treated as unproblematic and uncontroversial. One contributing factor to this view of knowledge is that controversial topics are glossed over or avoided (e.g., consideration of alternative perspectives on historical events such as the American Revolution or U.S. participation in Vietnam). Secondly, the authority for "knowing" resides consistently with the text and/or the teacher. For example, the science texts follow the pattern that the text or the teacher asks questions of the whole class, and students respond to the teacher, without encouraging the teacher to build in interaction between and among students to communicate that they could ask their own questions or that they could construct answers together (instead of merely locating them in the text). Rarely are students asked to go outside the text for additional or alternative information. In the case of the music and art series, there is little written text in the student edition for students to read and discuss. Instead the teacher is directed to take on the powerful mediating role of presenting information to students.

Knowing what or how, not why. Each series tends to separate learning of knowledge and skills. Some emphasize *knowing how*, or doing (e.g., mathematics, art, music) but not why. Others emphasize *knowing what*, or learning content (e.g., science, social studies, literature) but not why. Ways of knowing, or how knowledge is constructed and appraised in the disciplines is not part of each potential course of study.

When *knowing how* is emphasized, conceptual understanding and critical thinking have a minimal role in learning. Learning mathematics, for example, consists of learning a fixed set of rules and procedures and applying them to problems as sets of exercises. Instead of investigating how or why particular concepts and topics are related and how particular rules or procedures may apply to one or more concept or topic, skills are treated incrementally and organized in a hierarchy. The music series claims to organize instruction around five key strands (conceptual development, listening skills, music reading, movement skills, and performance skills) but emphasizes performance throughout the recommended activities. When concepts are included, they are small, isolated, fragmented, and not connected to larger ideas, themes or issues. Musical knowledge is a body of symbols and facts to be memorized and recognized, with little attention paid to what these symbols and facts have to do with the performance that is emphasized. Similarly, the art series emphasizes creating art over the other two curriculum strands, looking at and living with art. Students are taught to use particular design elements and not encouraged to consider what an object may communicate. Moreover, art criticism means using appropriate vocabulary and criteria to describe, analyze, and interpret artworks, with few opportunities to express or explore personal opinions or responses.

When *knowing what* is emphasized, linkages between and among concepts or across curriculum strands is scanty, and comprehension and memorization overshadow critical thinking. The science series claims to provide "uninterrupted concept development" that results in repeated exposure to concepts rather than helping students understand important linkages between concepts across the four curriculum blocks. For example, in Grade 2, topics such as how plants grow (Life Science), heat and light (Physical Science), and our sun (Earth Science) lend themselves to potential linkages of the use of sunlight by plants for growth. Yet

each topic is treated separately and no linkages are promoted. In addition to missing opportunities for students to revisit important concepts in multiple contexts, this may also communicate to both teachers and students that the various branches of science are distinct and unrelated, and science is a collection of isolated subjects. With the emphasis on reading comprehension, vocabulary, and memorization, science becomes a process of memorizing facts and definitions and doing activities to confirm existing knowledge that has been created by scientists.

The content in the social studies series is a mixture of facts from history and geography, covered in a "parade of facts" fashion. There is not enough content in the lower grades (covering obvious information such as "people live in different kinds of houses") and too much in the upper grades (emphasizing breadth of coverage over depth of understanding about key ideas). Although themes and issues are embedded in the content (e.g., how the social world works and how it got to be that way; sources of social conflict in history), students are given no help in recognizing or thinking critically about them. Nor is much consideration given to how knowledge in the disciplines is constructed (e.g., history as interpretation of events). When skills are taught (e.g., mapping and graphing skills), they are not well integrated with the knowledge content. Other skills are related to reading comprehension (e.g., reading for main idea, sequencing, compare and contrast, summarizing) and seem to be taught for the sake of developing the skill rather than to help students become critical readers of text.

In the literature series, when literary content is taught at all, learning of facts and concepts is emphasized. Although literary elements are included, they tend to be treated as comprehension and retelling experiences, instead of helping students use knowledge of literary elements to understand and explain their own response to literature as art. Critical thinking about literature is subjective, drawing only on whether students "like" the material. Quality in literature is defined as liking or not

liking, without consideration of how experts in the discipline might arrive at notions of quality. The majority of the "content" is actually the teaching of reading and writing, using literature as a tool, and emphasizing comprehension rather than analysis of response.

A Course of Study That Promotes Thoughtfulness?

Genuine engagement in learning of subject matter includes teaching for understanding, appreciation, and application. It includes teaching for a "literacy of thoughtfulness" that encompasses "the enhanced abilities to think critically and creatively; to reason carefully; to inquire systematically into any important matter; to analyze, synthesize, and evaluate information and arguments; and to communicate effectively to a variety of audiences" (Brown, 1991, p. xiii). The similarities across these sets of instructional materials portray a potential course of study that does not lend itself to thinking, reasoning, inquiring, and appraising knowledge. Instead, knowledge is treated as "out there" to be transmitted by teacher and text and received (going unchallenged) by students. Knowledge is selected and organized in ways that sidestep tackling larger issues, themes, and key ideas that scholars in the disciplines have grappled with for centuries. A sense of the disciplines' past, or the social nature of knowledge development is not likely to be communicated throughout the series. Moreover, as students "receive" the knowledge, they do so in isolation from each other, rather than engaging in discourse that enables genuine inquiry and communication among diverse groups.

Pedagogy and Learning Community

Instructional materials are a resource for teachers and therefore do not necessarily encompass the totality of experiences that are made available to students. In fact, researchers and teachers both report that there is wide variation in how texts are used in classrooms (Goodlad, 1983; Stodolsky, 1989). Nevertheless, looking at the recommended activities and assignments along with the suggested discussion

questions in the teacher and student text is one way to appraise the potential of the instructional materials as a useful resource for teaching for understanding, appreciation and application and for the kind of learning community that is likely to emerge if the materials are used as directed. Social interaction--what teachers and students talk about, and with whom--is a key factor in any learning community (Barnes, 1976; Cazden, 1986; Featherstone, 1990). Moreover, the roles and responsibilities taken on by both teachers and students shape what is paid attention to in classrooms and what counts as valid ways to spend time (Bernstein, 1975). Likewise, activities and assignments frame students' attention in particular ways, focus on particular knowledge and skills, and communicate what will be rewarded in the classroom (Doyle, 1983; Erickson, 1982). When the activities, assignments, modes of evaluation and recommended discourse in each series of instructional materials were examined, additional aspects of the modern instructional materials mold became apparent: a common lesson format that supports teachers in "managing" students and instruction, an interactive style that supports teachers in transmitting knowledge and students in receiving it, and a learning community in which completing work is valued over learning.

Managing Instruction Through Structured Lessons

The lesson format used in the various instructional materials is remarkably similar. Madeline Hunter (1984) referred to a template for designing lessons as "a basic white sauce of teaching" (p.175), which teachers (the cooks) use and adapt creatively to particular situations: anticipatory set, objective and purpose, input, modeling, checking for understanding, guided practice, independent practice. Such a template seems to have had enormous influence on the way lessons in each series are structured. In the case of the mathematics materials, the authors explicitly acknowledge following Hunter's model of instruction to design lessons. Although the

exact components listed above are not labeled as such, the typical lesson pattern in each set of materials incorporates them into four phases.

Introduction and motivation. In all the materials, there is an introductory phase to the lesson that typically serves two purposes: to introduce or anticipate the lesson content and to interest or motivate students. In some cases, in the introductory phases there is also an attempt to acknowledge students' prior knowledge or experience with the topic, although no further reference is typically made anywhere else in the lesson. This is a missed opportunity to make use of students' prior knowledge or possible misconceptions as an important part of the lesson development.

Development and practice. The second phase includes concept or skill development and practice. As described earlier, the science, social studies, and literature materials tend to emphasize "knowing what," which includes comprehension and memorization of definitions and facts, learning vocabulary, and retelling what was read. Thus, activities center around knowledge display rather than knowledge construction or inquiry. When skills are included in lessons, they are treated separately from the content, and their application tends to be divorced from authentic situations in which one would actually use them in the disciplines, and are not genuine examples of problem solving in the field. In the case of the science materials, many fun or "hands-on" activities are included, but little emphasis is given to what students may be learning from doing them or how doing a hands-on activity relates to the concept being taught. Or, in the case of the literature materials, while the series claims to be teaching students to understand literature, it actually focuses on something else--teaching language arts skills (e.g., reading comprehension, vocabulary study, word-attack skills, sequencing). The mathematics, art, and music lessons tend to focus on "knowing how," which includes developing skills (e.g., computation, singing songs, art production, using design elements).

Regular attempts are made to provide fun ways to practice skills, such as in the mathematics materials. When knowledge is included, it is in the form of isolated facts and definitions to be received and memorized.

Reinforcement and evaluation. The next phase in the typical lesson is a reinforcement and evaluation stage designed to assure the students retain information or are able to accurately use skills, with built-in ways to reteach for those who need more practice. Assignments generally come in the form of workbook pages that require one-word answers or short phrases, and focus on recall of isolated facts or use of specific skills. Even essay writing (e.g., in social studies) tends to focus on recall of basic facts rather than providing experiences for students to grapple with complex issues or use knowledge learned to define and solve problems. In the case of the literature materials, some writing assignments are good opportunities for students to think creatively, yet the thinking is directed away from consideration of aesthetic aspects of literature.

Application and enrichment. The final phase, application and enrichment, is the closest the materials come to providing ways to use knowledge and skills in meaningful contexts and to getting students to think critically or creatively about what they are learning. This linear pattern may communicate that one must learn basic facts and skills first before one can think creatively or analytically. Unfortunately, many activities and assignments labeled as "thinking activities" or "extensions" are problematic. For example, some do not actually require higher level thinking such as analysis and synthesis of ideas or critical appraisal of text, even though they may claim to. Some that do require higher levels of thinking do not draw on the knowledge taught in the lesson, and thus are not actually extensions of the main ideas or concepts in the lesson itself. An additional problem is that many are optional and likely to be left out of the curriculum due to lack of time, or they seem tacked on as afterthoughts rather than as integral parts of the lesson. In the

case of mathematics, where story problems are an important vehicle for application of concepts, accurate computation is stressed rather than the thinking students use to solve the problem.

Lesson sequence. In addition to this noticeable pattern in the way lessons are structured and the ways knowledge and skills are treated within the typical lesson structure, the sequencing of lessons does not emphasize important connections among ideas. For example, although the introduction may include attention to students' prior knowledge and experiences, there is no examination of these ideas or carry over within or across the lessons. Moreover, as each lesson is taught, ideas or skills from previous lessons are not incorporated into the next lesson(s) in a cumulative fashion. There is adequate variety of activities within the lessons, and isolated examples of good activities or lessons were found in each series. However, they are not consistently present and are not connected to other lessons to create a potentially meaningful or challenging course of study.

Hunter (1984) emphasized that lessons are *designed* (not just conducted), and that teachers who implement them must use artistry and judgment in how the basic template is used. For example, teachers select which activities and assignments to have students complete and emphasize some over others. Therefore it is important to acknowledge that written materials are potential tools that may or may not be used in classrooms, and how they are used is as important as whether they are used. This leads to consideration of the nature of the interaction likely to surround the written materials, or the potential learning community in which they are used.

The Learning Community

What teachers and students do together and are responsible for, as well as what they talk about and the nature of their interaction are all important aspects of learning communities (Barnes, 1976; Cazden, 1986; Featherstone, 1990). What are

classrooms in which the written materials are used likely to look like, and what counts as appropriate and valuable participation and learning?

Discussion as knowledge display. If teachers used the recommended discussion questions and followed the recommended instructional format, the majority of the interaction in the classroom would be whole-group discussion led by the teacher, with little interaction among students that is not teacher-directed. Knowledge display through recitation of right answers and appropriate facts and definitions, with little elaboration or extended discourse would characterize most discussions. Moreover, the teacher and text would hold authority for knowing; the answer sought is typically in the text, not in the students' heads or to be jointly constructed in the learning community. Debate, judgement, and use of evidence to inquire into genuine questions is not the norm in the suggested approaches to discussions. When small-group discussion and cooperative learning are included (e.g., in the mathematics series, especially in the upper grades) the content of the group work is not tied to the rest of the lesson, and therefore appears tacked on rather than being an integral part of the learning process. In the science materials, cooperative learning groups are mentioned in the introduction to the teacher but are not suggested in specific lessons. This could be interpreted as promoting cooperative learning but there is little support for the teacher as to how or when to do so. Despite rhetoric regarding the importance of discourse in learning about literature, for example, teachers' and students' attention is directed toward comprehension of the selections rather than on critical appraisal of the literature drawing on individuals' response to literature.

Roles in the workplace. The teacher's role in the learning community, then, is likely to be to "transmit" knowledge to students through structured lessons. Discussion focuses on helping students understand and retain information that is in the text (or explained by the teacher when little written text is available, such as in art and music). The teacher also facilitates students' "mastery" of information and

skills by implementing the initial lesson design found in the written materials and by making adjustments suited to the particular group (although little if anything is said about what adjustments are likely to be required and how to make them). The corresponding student responsibilities include reading, giving right answers, and completing assignments to display their knowledge and skills. They are responsible for their own learning and for completing their own work, not for the learning of others. The learning community is a workplace that centers around a reading, recitation, seatwork framework that emphasizes completing work that is intended to result in "mastery" of information and skills. There is not an emphasis on learning, if learning includes understanding networks of ideas, or inquiring into tough questions that engage students in learning content in order to address key questions, or figuring out what counts as evidence in support of an idea or argument, or critically appraising a literary selection or an art object. Likewise, there is not an emphasis on pedagogy, if pedagogy includes supporting students in constructing understandings and developing skills and using new knowledge and skills in meaningful contexts. Instead, it is managing the workplace and seeing to it that work--mostly in the form of worksheets--is done.

What counts as knowing. Another place to look to get an idea of the likely learning community is how assessment and evaluation are handled in the written materials. What is assessed, and how? One might ask, what do the materials recommend should be valued as knowledge and what learning processes and products are to be rewarded in this learning community? Although both the science and social studies series claim to emphasize critical thinking and problem solving, ongoing assessment (through worksheets, quizzes, and discussions) and summative assessment devices (e.g., chapter tests) focus on recall of definitions and facts and accurate use of skills in specific contexts. Ongoing assessment is argued to be an important aspect in the literature materials, and yet virtually no attention is given to

helping the teacher figure out ways to assess students' knowledge of literary elements and techniques or how students use that knowledge in constructing their response to literature. If worksheets and assignments are intended to fulfill an assessment function, then reading comprehension, vocabulary study, word-attack skills, and sequencing are examples of what a teacher would assess on an ongoing basis. Critical thinking would merely add up to giving one's subjective opinion of a selection. Mastery of literature includes comprehension of a selection, or being able to apply the content or theme of a selection to one's life, code of ethics, or to acquiring other subject matter knowledge. There is serious omission of keeping track of how children come to understand literary selections as art and how knowledge needed to understand and appreciate literature develops over time. As previously stated, although the series claims to teach children about literature, it promotes teaching and assessing language arts knowledge and skills and sidesteps documentation of critical thinking.

Similar problems exist with assessment in the mathematics, music, and art series, which all emphasize "knowing how" over "knowing what" or "knowing why." Each chapter in the mathematics series includes a chapter review, cumulative tests, and reteaching pages, all geared toward assessing computational competency. When computation is done in the context of problem solving, right answers are focused on more than the thinking that goes into solving the problem--again rewarding computational accuracy. In art and music, visual and auditory discrimination skills are assessed, leaving out personal reflection, interpretation, synthesis, and evaluation. There is no attempt to encourage teachers to document how personal thinking changes over time.

How Written Materials Support Teachers

The sets of written instructional materials examined include an array of items such as the student text, a teacher's guide, scope and sequence charts, supplementary

materials (e.g., workbooks, tests), and suggestions for additional resources. While some materials are intended to be used directly with students in the classrooms (e.g., student text, workbooks, tests), others are more likely to be used by teachers outside the classroom as resources to prepare for instruction (e.g., teacher's guide, supplementary background reading). To what extent are commonly used instructional materials based on a coherent and manageable teaching model? What kind of rationale and overview (e.g., scope and sequence chart) is provided to the teacher to communicate the intent of the series? To what extent do these resources support teachers in teaching for understanding, appreciation, and application of knowledge? What role do the resources promote or assume for the teacher in developing and implementing curriculum? What kind of content and pedagogical knowledge is required for the teacher to use the resources effectively?

A Convenient and Accessible Resource Package

Several features of each series make them practical, convenient, predictable, and easy to use. For example, the organizational framework around which each series is organized provides built in ways for teachers to make decisions about what to cover and in what order. For instance, the science materials are organized around four major areas of study. Teachers have options to "customize" the curriculum--through choosing and ordering areas of study to pursue and following recommendations for lessons labeled as optional or required. This potential customization is discussed as an advantage of the series that allows teachers to cover content they like to teach at each grade level. In the social studies series (organized around an expanding communities framework), teachers are encouraged to make their own decisions regarding the order in which they teach units, although it is implied that units should remain intact as they are taught. The curriculum strands that organize the chapters in the literature series (e.g., genre, theme, literary elements) allow for teachers to choose particular chapters to cover and to decide on

their own order. The four curriculum strands in the music series--music for living (social, historical, and cultural study of music), understanding music (concept and skill development), sharing music (performing), and sing and celebrate (holiday and other songs for singing)--provide a similar "menu" from which teachers can choose to cover and order their curriculum. In the mathematics series, the chapters include mathematics topics that represent strands appropriate to each grade level (e.g., addition, subtraction, measurement), and the topics are treated separately. For the most part, conceptual development is used to provide a foundation for a corresponding skill. Since the strands are interwoven throughout the chapters, teachers could presumably select particular chapters to teach. They may feel obligated to keep each chapter intact and not change the order, since there are occasional references to skills taught previously.

As discussed previously, the typical lesson framework follows a Hunter-style teaching model and provides a predictable, convenient, and easy to use instructional pattern. The built-in motivational activities, lesson sequences, and reinforcement activities could be followed as a daily teaching plan, and the recommended materials are either provided, or are generally easily accessible. Advice regarding classroom discourse is restricted to providing scripted answers to comprehension and recall questions or says "answers will vary" if no correct answer is needed. Discourse is taken as unproblematic, rather than as a complex form of communication in which students and teachers will exchange and appraise ideas to construct and clarify knowledge. Asking "why" or "how do you know" in class discussions is not a prominent feature in the recommendations to the teacher. Similarly, advice regarding strategy implementation is treated as a management and implementation issue rather than focusing on ways to structure activities that support and encourage exploration of subject matter concepts in a complex and diverse learning community.

Each series does provide its own version of a scope and sequence chart, although some are more easily accessible than others. However, rationales for why particular content and skills have been included are either weak (social studies, science); do not match the actual activities in the chapters (mathematics); are missing (music, art); or they do not provide a rationale for the subject matter they claim to teach (literature). These weaknesses or omissions would not invite or encourage teachers to consider a rationale for their own choices regarding which chapters and/or lessons to include, particularly consideration in light of the characteristics of the learners in their classrooms.

These prominent features across the materials, along with the nature of the advice to the teacher, would support (and seems to promote) a teaching pattern of surface content and/or skill coverage. Teachers are not encouraged to consider what understandings and experiences students bring to the learning situation, nor to promote interaction that would raise questions and encourage critical thinking, nor to question whether or how students understand the content or skills once they are taught. Each lesson sequence is self-contained with little, if any, reference made to the content or activities in previous lessons. Even when teachers are encouraged to elicit students' ideas (e.g., in motivational activities at the beginning of the lessons), they are not encouraged to make use of these ideas throughout or at the end of the lesson itself.

Teacher as Consumer and Implementer

A view of the teacher as instructional materials consumer and implementer, rather than as thoughtful professional, comes through strongly in these materials. Although each series does emphasize the decisions teachers need to make in using the resources, deciding which chapters or units to teach and/or selecting which enrichment lessons to include on top of the "required" lessons hardly constitutes a professional activity such as thoughtful curriculum development, especially since

there is little if any discussion of students as learners in relation to such decisions. Moreover, the teacher is not viewed as a learning professional who seeks to understand more about the subject matter, particular representations and strategies used to teach the subject matter, or about the students' understanding and appreciation of subject matter. Instead, the teacher is a consumer or user of the materials created by others who have presumably thought about such matters. From this viewpoint, teachers would not necessarily get smarter about these issues either, but instead, merely use others' ideas. At best, the teacher fits into Hunter's (1984) image of the cook using a "basic white sauce of teaching" created by another cook, where creativity and adaptation take place at the implementation level.

Summary: A Teaching Resources Mold

In both format and substance, the instructional materials typically available to teachers fit a similar and familiar mold, and therefore have the potential for influencing the content taught and instructional methods used in elementary classrooms across the school day. They provide a total package that teachers can either use flexibly, by choosing particular units and chapters to study, or they can follow the curriculum in its entirety. The materials themselves are attractive, colorful, and designed to stimulate student interest. Features such as boldfaced headings and chapter summaries have been added to make the text material more easily comprehensible to students. The lesson format provides a way for both students and teachers to follow predictable routines that can help them both know what to expect. Likewise, chapter and unit tests that follow a predictable (mostly objective) format that can make clear what is expected as learning outcomes. In general, teaching resources fitting this mold could serve as a real support to teachers who are responsible for teaching several subjects across the school day within limited blocks of time. Yet when a closer look is taken at the potential courses of study and the likely pedagogy and learning community, some concerns arise.

As recommended courses of study, these resources either have unclear goals, or the stated goals are not consistent with the subject matter content and instructional methods outlined in the materials. Thus, teachers get little or confusing guidance regarding broad goals in each subject matter area. Moreover, the materials communicate a limited conception of the disciplines, emphasizing learning of discrete facts and vocabulary ("knowing what") and isolated skills, rules and procedures ("knowing how"). Treating learning of knowledge and skills separately, the materials leave out aspects of the disciplines concerned with "knowing why," such as understanding linkages between and among concepts; exploring when, how, and why particular skills or procedures are applicable; or developing critical thinking about important questions in the disciplines and issues that relate to life applications. The lack of controversial topics or issues of substance make for a rather bland and neutral selection of content. Breadth rather than depth of coverage is the norm.

Although students are mentioned frequently in the materials, it is mostly in relation to what they are to do (e.g., completing activities and assignments), rather than in relation to what they may bring to the learning situation in terms of prior knowledge and skills and how the choice and sequencing of content relates to their development as active learners. The knowledge in the materials is to be received by them, and skills are to be mastered. Critical thinking and problem solving are typically included after students would have learned facts, vocabulary and basic skills, perhaps communicating to both teachers and students that these are extras that could be left out if time does not permit. Authority for knowing in the various subject matters rests either in the teacher or the text (or both), with little emphasis on students' constructing their own understandings or engaging in authentic problem solving. The typical lesson structure promotes individual seatwork over

group interaction, cooperative learning, and exploration of ideas. Typical assessment emphasizes factual recall and mastery of skills.

Although a variety of choices are built into using the materials, teachers' choices are generally directed at the level of implementation (e.g., deciding whether to cover a certain topic, selecting among optional activities, choosing particular chapter or unit tests). Although teachers are encouraged to adapt the curriculum to their own students, there are no expectations communicated in the teacher's guide to explore students' thinking and tackle complex issues regarding what students actually understand about the subject matter content or ways in which students might use content and skills to address substantive problems or issues. One does not get the sense that teachers might be learning professionals whose knowledge of their students and subject matter might grow over time or that they might become engaged intellectually in their work.

Concerns such as these regarding the kinds of resources available to teachers raise the question of whether there are alternatives. What would materials that break out of this mold look like and to what extent would alternative materials support teaching for understanding, appreciation and application in the various subject matters?

New Trends in Instructional Resources

Center researchers were able to locate examples of instructional materials in some subject matter areas (social studies and mathematics) that break out of the typical mold in significant ways (See Appendix A). We call these examples "distinctive instructional materials" because of their potential for supporting teachers in teaching for understanding, appreciation, and application. This includes going beyond separate teaching of knowledge (isolated facts and vocabulary) and skills, offering richer conceptions of the disciplines from which the school subjects derive, and providing alternative approaches to pedagogy and creating a learning

community. In mathematics, three curriculum series for use in grades 1-6 make deliberate attempts to provide views of mathematics and mathematics teaching and learning that break from what is traditionally found in U.S. schools. In social studies no alternative series were available. Instead, various supplemental materials were critiqued. They focus on limited topics in economics, government and law, and history and critical thinking, reasoning, and decision making. These mathematics and social studies materials are distinctive in that they reveal new trends in how instructional materials can frame potential courses of study and support teachers in pedagogy and creating learning communities. They provide alternative images of what resources for teachers can look like.

Alternatives in Framing Potential Courses of Study

The goals in the distinctive materials are generally clearer and more accessible to teachers than in the commonly used materials discussed earlier. They have a clear orientation that draws on important concepts, skills, and "ways of knowing" in the disciplines from which the school subjects arise. For example, goals in the three mathematics series go beyond teaching students to compute well to include integration of conceptual, procedural, and aesthetic aims. This includes portraying mathematics as problem setting and sense making along with problem solving (*Real Math*), as an arena in which one constructs arguments and learns the "ways of knowing" associated with the discipline (*CSMP*), and as a way of looking at and thinking about the world (*Math in Stride*). Learning mathematical language, an aspect of how knowledge grows in the discipline, is also considered an important goal in *CSMP*. Dispositional goals include engaging students in meaningful problem solving that involves life applications, and learning to appreciate the beauty and symmetry in the world through mathematical studies.

The social studies supplementary materials are developed around fostering understanding of a focused set of concepts (related to economics, history, law, etc.)

and also include attention to supporting students in developing critical thinking, problem solving, and reasoning skills as well as values and attitudes associated with citizen participation. There is an emphasis on helping students understand how concepts and skills are applied to particular situations, sometimes resulting in a learning by doing approach to the materials (*Mini-Society*), sometimes emphasizing ways in which the concepts taught can be used in particular situations and generalized across situations (*Children in the Marketplace*), and sometimes taking a case analysis approach (*Everyday Law for Young Citizens*).

Consistent with the distinctive materials' stated goals, knowledge and skills are not treated separately. Instead, there is consistent integration of developing conceptual understandings and skills with their use in meaningful contexts (e.g., life applications, problem framing and solving, case analysis), as well as use of critical thinking and reasoning (in both mathematics and social studies) and values analysis and clarification (in social studies). In the three mathematics series, there is an emphasis on supporting students in developing conceptual understanding prior to learning rules, procedures or algorithms. This contrasts with the approach used in commonly used materials where students learn and practice computational skills. Regular presentation of thinking stories (*Real Math*) and problematic situations (*CSMP* and *Math in Stride*) that require the development and use of mathematical thinking and reasoning are alternatives to the standard "story problems" (that require the use of algorithmic skills) found in commonly used materials. In their organization, all three mathematics curriculum series offer an alternative to the "spiral of coverage" typically found in the commonly used materials where there is a hierarchical, mastery-oriented organization or repetitious treatment of similar topics over time. For example, *Real Math* provides ways for primary students to revisit curriculum strands such as counting numbers over time in different contexts (e.g., use of money, the calendar, number line). *CSMP* is organized into four

curriculum strands with topics such as fractions appearing in various forms in each strand. Likewise, *Math in Stride* is organized into a number of foci, enabling specific topics such as classification to be addressed in various ways as different foci are considered. This type of spiralling assumes that when students revisit a topic, they will build in their previous knowledge and understanding as they consider the topic in a new context.

Since the social studies supplementary materials are intended as supplemental units, they do not provide alternative images of ways to organize a yearlong curriculum or a K-6 program. However, they do illustrate ways to develop units of instruction that focus on developing understandings of a limited set of concepts. Some are also examples of substantive units that could be taught to younger children (ages 7 and up) and offer therefore an alternative to the limited subject matter contained in the "expanding communities" organizational scheme. The *Mini-Society* program is an interesting example of "learning by doing" in economics. Students are supported in developing understandings of a network of key ideas drawn from economics by engaging in critical and creative thinking, problem solving, and decision making as they work together to establish and run businesses, vote on policy issues, and participate in debriefing sessions that require reflection on and analysis of classroom activities. By making knowledge use part of the daily curriculum (rather than omitting it or adding it on as supplementary activities once the facts or basic skills have been learned), the recommended course of study adds up to more than mere content coverage, and provides opportunities for students to become intrigued with issues and problems.

Some of the distinctive materials are developed with specific attention to the understandings, creative and critical thinking abilities, and dispositions students bring to the learning situation. Developers of the three mathematics series all assume that students bring informal knowledge and abilities, as well as interests, to

the classroom that can be surfaced, developed and formalized. The spiral organization of the curricula, with increasing depth of treatment of topics and concepts in different contexts over time, is a response to these assumptions about learners. Among the social studies supplemental materials, only *Mini-Society* makes explicit assumptions about specific knowledge students are likely to bring, and likely misconceptions that need to be addressed. The other materials make no reference to students' prior knowledge and experience.

Alternative Images of Pedagogy and the Learning Community

Alternative approaches to pedagogy and developing a learning community that center around a high degree of student involvement are recommended. Classroom discourse that is open-ended, exploratory, and based on use of evidence and reasoning is prominent across the distinctive materials. This methodology places less emphasis on the teacher and text as the authority for knowledge, giving students the responsibility to construct their own understandings instead of receiving and remembering information. The teacher becomes discussion facilitator and resource, rather than dispenser of knowledge. For example, in *CSMP*, mathematical language and reasoning are taught explicitly to students, thus sharing the "ways of knowing" that are part of the discipline with students, bringing them into the world of mathematical knowledge construction. Although mathematical argument is not represented in *Math in Stride*, exploration, prediction, invention, experimentation, calculation, developing and testing strategies, and discovering relationships are prominent.

Open-ended and analytic discourse is also a prominent classroom activity in the social studies materials, along with other interactive kinds of experiences such as role plays, debate, and cooperative learning. This opens the door for treating some topics in the social studies less neutrally than in the commonly used materials. For example, in *Mini-Society*, students must grapple with ways in which they can meet

their own economic self-interests while still considering ways in which the public good is affected. Opportunities for critical appraisal of events and decisions in history are also provided, such as in the *Creative Activities for Teaching U.S. History* where students take on roles of various decision makers in the development of the West. Similarly, discussion of the fairness and appropriateness of laws is built into *Everyday Law for Young Citizens*, not just teaching children what laws say. However, some materials, such as *Children in the Marketplace*, take an uncritical stance toward the U.S. market economy, rather than using study of the economy to think critically about its effect.

The lesson structure in the distinctive materials generally breaks away from a mastery of content and skills format. There is greater variety of activities and opportunities for students to work cooperatively. Learning by doing characterizes many of the materials, whether it takes the form of creating in microcosm an economic community (*Mini-Society*), having "what if" discussions of actual legal cases (*Everyday Law for Young Citizens*), or using manipulatives and pictorial devices to explore mathematical concepts and ideas (*Math in Stride*, *CSMP*). Instead of a workplace image where students complete worksheets, striving individually for correct answers, the distinctive materials suggest an image of a learning place (Marshall, 1990; Rosaen, Lindquist, Peasley, & Hazelwood, in press). In such a learning community, there are opportunities for knowledge to be constructed through classroom interactions as well as individual work, and all members of the community have the opportunity to collaborate to pursue important issues and questions. Pursuing understanding, not just getting right answers or memorizing facts, become important ways to spend time.

The distinctive materials provide alternative images of pedagogy and learning communities but are less effective at providing alternative ways to assess student learning. For example, although *Real Math's* goals and pedagogy stress problem

setting and sense making, the diagnostic and unit tests consist mainly of computation and routine story problems. *Math in Stride* provides a variety of approaches to assessing conceptual understanding, emphasizes application of concepts, and stresses the diagnostic use of the assessment devices for informing ongoing instruction. However, teachers are encouraged to diagnose in order to figure out what needs to be fixed, rather than to find out what students understand about a particular concept. *CSMP* sidesteps the assessment issue altogether by providing no formal testing or evaluation, and recommends that teachers monitor student progress on assignments; however, what to look for or how to keep track of progress are not discussed.

Teachers get quite a bit of guidance from *Mini-Society* materials regarding ways to evaluate their implementation of the program. Instead of emphasizing ways to measure individual students' understanding and growth, the program encourages teachers to use qualitative judgements about learning in relation to how well the businesses in the mini-society function. Thus, students and teachers get immediate feedback as to whether students can use the concepts taught. Teachers must determine on their own which concepts and principles might need further discussion or clarification and how they will communicate with students regarding their understandings and use of knowledge. The other supplementary social studies materials provide little or no specific information regarding assessment, although some of the materials (e.g., *Citizenship Decision-Making*) do provide authentic opportunities for application of the knowledge and skills taught in the curriculum that could be used for assessment purposes.

Alternative Roles for Teachers

One consequence of the distinctive materials' move away from being step-by-step resources that spell out ways to achieve efficient content coverage through a patterned lesson format is that the teacher becomes more than a curriculum consumer and implementer. Embedded in many materials is the assumption that

teachers are learning professionals who are curriculum developers and mediators. In many cases where the recommended pedagogy centers around learning by doing, co-construction of knowledge through open-ended discourse, and critical and creative thinking (e.g., *Mini-Society*, *Everyday Law for Young Citizens*, *Math in Stride*, *CSMP*, *Real Math*), teachers would need to have considerable subject matter knowledge and skill in facilitating discussions, because the materials provide little guidance. Although the *CSMP* materials are more explicit in their guidance by providing scripted lessons, they lose some of the flexibility offered in materials such as *Math in Stride* that have more open-ended guidance regarding how to proceed. *CSMP* also recommends extensive inservice for teachers as they use the materials, thereby providing ways for teachers to develop mathematical knowledge and pedagogical skills gradually as they work with students. *Real Math* provides a lesson framework that could support teachers in facilitating mathematical discourse, however, teachers who are not familiar with the reasoning and philosophy behind particular strategies could miss their potential richness in the way they implement them.

The *Mini-Society* materials do not provide a scope and sequence chart or a list of concepts and principles (although a companion volume on economics is available). The materials do provide, however, fairly extensive information regarding students' potential knowledge and likely misconceptions, yet provide little information to teachers regarding ways to carry out the debriefing sessions required to get students to reflect on their learning experiences. Generally, the supplemental social studies materials describe an array of suggested activities but place little emphasis on helping teachers *learn to facilitate* the kind of classroom dialogue and social interaction required if students are to construct their own meaning. Moreover, knowledge of the subject matter in the supplementary materials is

assumed, with little if any discussion of complex concepts that might enrich the teachers' understandings.

Summary: Breaking Out of the Mold?

Although the distinctive materials still need to be improved in some areas, they do provide examples of ways to break out of the instructional materials mold that has dominated the market for so long. They illustrate ways to focus on important topics in greater depth, addressing the problem of surface content coverage. They provide examples of an appropriate spiral approach to organizing curriculum that treats topics in increasingly greater depth and alternative contexts and avoids mere repetition of topics across the grades. They provide opportunities for teachers to become developers and mediators of curriculum (e.g., choosing when and how to teach particular concepts and skills, adapting lessons to students' prior knowledge and experience, and facilitating open-ended discussions that allow for collaborative knowledge construction). They also provide examples of learning activities that get students actively involved in their own learning and focus on "ways of knowing" as well as developing particular knowledge and skills. Given the variety of ways in which materials in two subject matter areas have broken out of the mold in both format and substance, it seems that instead of designing a new mold, developers of materials should continue to pursue a multitude of approaches suitable to the content area. It seems clear that there is no one answer to addressing problems with the existing mold.

Better and more specific ideas about how to assess student learning are still needed in these alternatives, along with better support to teachers in continuing their own professional learning as they develop and mediate the options provided. If teachers are to break out of the Hunterized format that has been embedded for so long in the commonly used materials, greater attention needs to be paid to supporting teachers' knowledge and skill development (e.g., key concepts and ways of knowing

in the disciplines, student's prior knowledge, ways to facilitate discourse). As alternatives address the complexities of teaching and learning in each subject matter area, they must not sacrifice too much clarity or ease of use and must provide ways for teachers to continue their own professional learning as part of their use.

Improving Instructional Practices Through Improved Instructional Materials

Can improved written instructional materials contribute to improving teachers' instructional practice? Maybe. The research reported in this report shows a clear need for improvements in the resources typically available to teachers, and how some distinctive materials have attempted to address some of the needs. It highlights examples of ways publishers could break out of the traditional mold they have created and used for so long. It provides some insights into how to increase the potential of materials in supporting teachers in teaching for understanding, appreciation, and application through making improvements in goals, content selection, organization, sequencing, recommended pedagogy and learning community, and directions to the teacher. It suggests expanded conceptions of teachers' roles as they use resources--learning professionals, as well as curriculum developers, interpreters and mediators.

There are some tough challenges remaining in heading toward improved instructional practices via improved instructional materials. For example, for improved instructional materials to become actually available to teachers on a large-scale basis, the existing textbook system does indeed need to be dismantled (Tyson-Bernstein & Woodward, 1991). Even if state and policy changes allow for and support adoption of improved instructional materials (e.g., Honig, 1991), there is much to be learned regarding the extent to which teachers' practices actually change (Cohen, Peterson, et al., 1990; Remillard, 1991). The complex array of factors that shape changes in instructional practices (e.g., teachers' experiences, knowledge and

beliefs; teachers' confidence and abilities as interpreters of resources; the nature of support available to teachers, and larger professional, social and political issues) still need to be considered. More studies of how improved materials are used and what students learn from their use are needed to address the tough issue of improving instructional practices more thoroughly.

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**Appendix A: Summary of Instructional Materials and Elementary Subjects Center
Series**

Summary of Instructional Materials and ESC Series

SUBJECT AREA	COMMONLY USED INSTRUCTIONAL MATERIALS and ESC SERIES	DISTINCTIVE INSTRUCTIONAL MATERIALS and ESC SERIES
SOCIAL STUDIES	Brophy, J. (1990). <u>The de facto national curriculum in elementary social studies: Critique of a representative example</u>. ESC Series No. 17 Materials studied: <u>Silver Burdett & Ginn social studies</u>, Morristown, NJ: Silver Burdett & Ginn, 1988.	Brophy, J. (1991). <u>Distinctive curriculum materials in K-6 social studies</u>. ESC Series No. 35. Materials studied: ECONOMICS PROGRAMS: (a) <u>Mini-Society: Experiencing real-world economics in the elementary school classroom</u>, Kourilsky, 1983. (b) <u>Small-size economics</u>, 1988, Skeel. (c) <u>Children in the marketplace</u>, 1986, Joint Council on Economic Education. GOVERNMENT AND LAW: (a) <u>Everyday law for young citizens</u>, 1988, Lipson & Lipson. (b) <u>Democracy for young Americans</u>, 1989, Aten. (c) <u>Our living constitution: Then and now</u>, 1987, Aten. HISTORY: (a) <u>A family history book</u>, 1985, Rife. (b) <u>U. S. history, book one: Beginnings to 1865</u>, 1985, McBee, Tate, & Wagner. (c) <u>Creative activities for teaching U. S. history</u>, 1988 <u>Citizenship decision-making</u>, 1978, LaRaus & Remy. (d) <u>Reasoning with democratic values</u>, 1985, Lockwood & Harris. CRITICAL THINKING: (a) <u>Critical thinking handbook: A guide for remodelling lesson plans in language arts, social studies, and science</u>, 1987, Paul, Binker & Charbonneau. (b) <u>Critical thinking handbook: 4th-6th grades, a guide for remodelling lesson plans in language arts, social studies, and science</u>, 1987, Paul, Binker, Jensen & Kreklau.
SCIENCE	Eichenger, D. & Roth, K. J. (1991). <u>Critical analysis of an elementary science curriculum: Bouncing around or connectedness?</u> ESC Series No. 32 Materials studied: <u>Science</u>, 1989, Silver Burdett & Ginn.	

MATH- EMATICS	Remillard, J. (1991). <u>Is there an alternative? An analysis of commonly used and distinctive elementary mathematics curricula</u>. ESC Series No.31. Materials studied: <u>Addison-Wesley mathematics</u>, 1987, Addison-Wesley.	Remillard, J. (1991). <u>Is there an alternative? An analysis of commonly used and distinctive elementary mathematics curricula</u>. ESC Series No. 31. Materials studied: (a) <u>Real math</u>, 1987, Open Court. (b) <u>Comprehensive School Mathematics Program (CSMP)</u>, 1978, CEMREL. (c) <u>Math in stride</u>, 1988, Addison Wesley, Innovative Division.
LITERA- TURE	Cianciolo, P., & VanCamp, M. (1991) <u>The analysis of commonly used literature curriculum materials</u>. ESC Series No. 30. Materials studied: <u>Odyssey: An HBI literature program</u>, 1986, Sebesta & Simons.	Cianciolo, P. & Quirk, B. (1992). <u>Critical analysis of a distinctive literature curriculum</u>. ESC Series No. 55. Materials studied: (a) <u>Handbook for planning an effective literature program, kindergarten through grade twelve</u>, 1987, California State Department of Education. (b) <u>English-language arts framework for California public schools, kindergarten through grade twelve</u>, 1987, California State Department of Education. (c) <u>English-language arts model curriculum guide, kindergarten through grade eight</u>, 1987, California State Department of Education. (d) <u>Recommended readings in literature, kindergarten through grade eight</u>, 1987, California State Department of Education.
ART AND MUSIC	May, W. T., Lantz, T., & Rohr, S. (1990). <u>Whose content, context, and culture in elementary art and music textbooks?</u> ESC Series No. 23. Materials studied: (a) <u>Discover art</u>, 1985, Chapman. (b) <u>World of music</u>, 1988, Silver Burdett & Ginn.	

Appendix B: Framing Questions

**Phase II Study 2: Curriculum Materials Analysis
Framing Questions**

A. GOALS

1. Are selective, clear, specific goals stated in terms of student outcomes? Are any important goals omitted? As a set, are the goals appropriate to students' learning needs?
2. Do goals include fostering conceptual understanding and higher order applications of content?
3. To what extent does attainment of knowledge goals imply learning networks of knowledge structured around key ideas in addition to the learning of facts, concepts, and principles or generalizations?
4. What are the relationships between and among conceptual (propositional), procedural, and conditional knowledge goals?
5. To what extent do the knowledge goals address the strategic and metacognitive aspects of processing the knowledge for meaning, organizing it for remembering, and accessing it for application?
6. What attitude and dispositional goals are included?
7. Are cooperative learning goals part of the curriculum?
8. Do the stated goals clearly drive the curriculum (content, activities, assignments, evaluation)? Or does it appear that the goals are just lists of attractive features being claimed for the curriculum or post facto rationalizations for decisions made on some other basis?

B. CONTENT SELECTION

1. Given the goals of the curriculum, is the selection of the content coherent and appropriate? Is there coherence across units and grade levels? (Note: all questions in this section should be answered with the goals in mind.)
2. What is communicated about the nature of the discipline from which the school subject originated?
 - a. How does content selection represent the substance and nature of the discipline?
 - b. Is content selection faithful to the discipline from which the content is drawn?
 - c. What does the relationship among conceptual (propositional), conditional, and procedural knowledge communicate about the nature of the discipline?
3. To what extent were life applications used as a criterion for content selection and treatment? For example, in social studies, is learning how the world works and how it got to be that way emphasized?

4. What prior student knowledge is assumed? Are assumptions justified? Where appropriate, does the content selection address likely student misconceptions?
5. Does content selection reflect consideration for student interests, attitudes, dispositions to learn?
6. Are there any provisions for student diversity (culture, gender, race, ethnicity)?

C. CONTENT ORGANIZATION AND SEQUENCING

1. Given the goals of the curriculum, is the organization of the content coherent and appropriate? Is there coherence across units and grade levels? (Note: All questions in this section should be answered with goals kept in mind.)
2. To what extent is the content organized in networks of information structured in ways to explicate key ideas, major themes, principles, generalizations?
3. What is communicated about the nature of the discipline from which the school subject originates?
 - a. How does content organization represent the substance and nature of the discipline?
 - b. Is content organization faithful to the discipline from which the content is drawn?
 - c. What does the relationship among conceptual (propositional), conditional, and procedural knowledge communicate about the nature of the discipline?
4. How is content sequenced, and what is the rationale for sequencing? For example, is a linear or hierarchical sequence imposed on the content so that students move from isolated and lower level aspects toward more integrated and higher level aspects? What are the advantages and disadvantages of the chosen sequencing compared to other choices that might have been made?
5. If the content is spiralled, are strands treated in sufficient depth, and in a non-repetitious manner?

D. CONTENT EXPLICATION IN THE TEXT

1. Is topic treatment appropriate?
 - a. Is content presentation clear?
 - b. If content is simplified for young students, does it retain validity?
 - c. How successfully is the content explicated in relation to students' prior knowledge, experience, and interest? Are assumptions accurate?

- d. When appropriate, is there an emphasis on surfacing, challenging, and correcting student misconceptions?
2. Is the content treated with sufficient depth to promote conceptual understanding of key ideas?
3. Is the text structured around key ideas?
 - a. Is there alignment between themes/key ideas used to introduce the material, the content and organization of the main body of material, and the points focused on in summaries and review questions at the end?
 - b. Are text-structuring devices and formatting used to call attention to key ideas?
 - c. Where relevant, are links between sections and units made explicit to students?
4. Are effective representations (e.g., examples, analogies, diagrams, pictures, overheads, photos, maps) used to help students relate content to current knowledge and experience?
 - a. When appropriate, are concepts represented in multiple ways?
 - b. Are representations likely to hold student interest or stimulate interest in the content?
 - c. Are representations likely to foster higher level thinking about the content?
 - d. Do representations provide for individual differences?
5. When pictures, diagrams, photos, etc. are used, are they likely to promote understanding of key ideas, or have they been inserted for other reasons? Are they clear and helpful, or likely to be misleading or difficult to interpret?
6. Are adjunct questions inserted before, during, or after the text? Are they designed to promote: memorizing; recognition of key ideas; higher order thinking; diverse responses to materials; raising more questions; application?
7. When skills are included (e.g., map skills), are they used to extend understanding of the content or just added on? To what extent is skills instruction embedded within holistic application opportunities rather than isolated as practice of individual skills?
8. To what extent are skills taught as strategies, with emphasis not only on the skill itself but on developing relevant conditional knowledge (when and why the skill would be used) and on the metacognitive aspects of its strategic application?

E. TEACHER-STUDENT RELATIONSHIPS AND CLASSROOM DISCOURSE

1. What forms of teacher-student and student-student discourse are called for in the recommended activities, and by whom are they to be initiated? To what extent does the recommended discourse focus on a small number of

topics, wide participation by many students, questions calling for higher order processing of the content?

2. What are the purposes of the recommended forms of discourse?
 - a. To what extent is clarification and justification of ideas, critical and creative thinking, reflective thinking, or problem-solving promoted through discourse?
 - b. To what extent do students get opportunities to explore/explain new concepts and defend their thinking during classroom discourse? What is the nature of those opportunities?
3. Who or what stands out as the authority for knowing? Is the text to be taken as the authoritative and complete curriculum or as a starting place or outline for which the discourse is intended to elaborate and extend it? Are student explanations/ideas and everyday examples elicited?
4. Do recommended activities include opportunities for students to interact with each other (not just the teacher) in discussions, debates, cooperative learning activities, etc.?

F. ACTIVITIES AND ASSIGNMENTS

1. As a set, do the activities and assignments provide students with a variety of activities and opportunities for exploring and communicating their understanding of the content?
 - a. Is there an appropriate mixture of forms and cognitive, affective, and/or aesthetic levels of activities?
 - b. To what extent do they call for students to integrate ideas or engage in critical and creative thinking, problem-solving, inquiry, decision making, or higher order applications vs. recall of facts & definitions or busy work?
2. As a set, do the activities and assignments amount to a sensible program of appropriately scaffolded progress toward stated goals?
3. What are examples of particularly good activities and assignments, and what makes them good (relevant to accomplishment of major goals, student interest, foster higher level thinking, feasibility and cost effectiveness, likeliness to promote integration and life application of key ideas, etc.)?
 - a. Are certain activities or assignments missing that would have added substantially to the value of the unit?
 - b. Are certain activities or assignments sound in conception but flawed in design (e.g., vagueness or confusing instruction, invalid assumptions about students' prior knowledge, infeasibility, etc.)?
 - c. Are certain activities or assignments fundamentally unsound in conception (e.g., lack relevance, pointless busy work)?

4. To what extent are assignments and activities linked to understanding and application of the content being taught?
 - a. Are these linkages to be made explicit to the students to encourage them to engage in the activities strategically (i.e., with metacognitive awareness of goals and strategies)? Are they framed with teacher or student questions that will promote development?
 - b. Where appropriate, do they elicit, challenge, and correct misconceptions?
 - c. Do students have adequate knowledge and skill to complete the activities and assignments?
5. When activities or assignments involve integration with other subject areas, what advantages and disadvantages does such integration entail?
6. To what extent do activities and assignments call for students to write beyond the level of a single phrase or sentence? To what extent do the chosen forms engage students in higher order thinking?

G. ASSESSMENT AND EVALUATION

1. Do the recommended evaluation procedures constitute an ongoing attempt to determine what students are coming to know and to provide for diagnosis and remediation?
2. What do evaluation items suggest constitute mastery? To what extent do evaluation items call for application vs. recall?
 - a. To what extent are multiple approaches used to assess genuine understanding?
 - b. Are there attempts to assess accomplishment of attitudinal or dispositional goals?
 - c. Are there attempts to assess metacognitive goals?
 - d. Where relevant, is conceptual change assessed?
 - e. Are students encouraged to engage in assessment of their own understanding/skill?
3. What are some particularly good assessment items, and what makes them good?
4. What are some flaws that limit the usefulness of certain assessment items (e.g., more than one answer is correct; extended production form, but still asking for factual recall, etc.).

H. DIRECTIONS TO THE TEACHER

1. Do suggestions to the teacher flow from a coherent and manageable model of teaching and learning the subject matter? If so, to what extent does the model foster higher order thinking?

2. To what extent does the curriculum come with adequate rationale, scope and sequence chart, introductory section that provide clear and sufficiently detailed information about what the program is designed to accomplish and how it has been designed to do so?
3. Does the combination of student text, advice and resources in teachers manual, and additional materials constitute a total package sufficient to enable teachers to implement a reasonably good program? If not, what else is needed?
 - a. Do the materials provide the teacher with specific information about students' prior knowledge (or ways to determine prior knowledge) and likely responses to instruction, questions, activities, and assignments? Does the teachers manual provide guidance about ways to elaborate or follow up on text material to develop understanding?
 - b. To what extent does the teachers manual give guidance concerning kinds of sustained teacher-student discourse surrounding assignments and activities?
 - c. What guidance is given to teachers regarding how to structure activities and scaffold student progress during assignment completion, and how to provide feedback following completion?
 - d. What kind of guidance is given to the teacher about grading or giving credit to participating in classroom discourse, work on assignments, performance on tests, or other evaluation techniques?
 - e. Are suggested materials accessible to the teacher?
4. What content and pedagogical knowledge is required for the teacher to use this curriculum effectively?

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